

IN THE UNITED STATES DISTRICT COURT  
SOUTHERN DISTRICT OF NEW YORK

NATIONAL RAILROAD PASSENGER  
CORPORATION,

Plaintiff,

vs.

ARCH SPECIALTY INSURANCE COMPANY;  
ET AL.,

Defendants.

Civ. Action No.:14-cv-7510 (JSR)

**DECLARATION OF  
MICHAEL THOMAS**

I, MICHAEL THOMAS, declare pursuant to 28 U.S.C. § 1746 as follows:

1. I am the Department Chair of the Department of Civil Engineering at the University of New Brunswick and the President of C&CS Atlantic Inc. I submit this declaration in connection with National Railroad Passenger Corporation's ("Amtrak") Opposition to: (1) Defendants' Motion for Partial Summary Judgment Regarding Replacement of Benchwalls and Track Bed and (2) Defendants' Motion for Summary Judgment Regarding Application of Flood and Occurrence Provisions.

2. As Amtrak's Rule 26 Expert, having inspected, received information, and issued a report regarding property at issue in this matter, I have personal knowledge of the following facts. If called upon to testify at trial, I would testify consistently with the following.

3. Seawater contains chloride and sulfate ions, both of which can be corrosive and detrimental.

4. The chloride concentration of seawater is typically in the range of 19,800 ppm. At this concentration, chlorides pose a threat to steel components that are embedded in concrete. The chlorides can initiate corrosion of embedded steel and the

formation of corrosion products (rust) can result in cracking, spalling and delamination of the surrounding concrete.

5. In October 2012, a storm surge due to Superstorm Sandy resulted in seawater inundation of four tubes of Amtrak rail tunnels in New York City; these were Lines 1 and 2 of the East River Tunnel (ERT) and both the North and South tubes of the North River Tunnel (NRT).

6. The limit and duration of inundation was different for each tunnel; the tunnels were dewatered between 2 and 5 days after inundation.

7. At that point, in relation to a number of factors that include the introduction of oxygen and carbon dioxide to previously inundated areas, physical damage to steel and steel-containing components in the tunnels commenced due to various forms of chemical attack.

8. The damage included damage to all of the components containing steel that had been exposed to saltwater following Sandy, including components containing steel not exposed directly to air and water, such as steel-reinforced concrete, by highly reactive salts, including chlorides that had thoroughly infiltrated essential tunnel components and were not removed by the dewatering process.

9. When the residual chlorides not removed via the dewatering were exposed to oxygen and moisture in the air, they began to attack the steel surfaces in the tunnels, including the steel reinforcements in the concrete.

10. Because the chemical reaction involved in chloride attack requires the presence of both chlorides and oxygen in a moist environment, chloride damage

gets underway when the material is no longer submerged. Once the damage process begins, however, it continues until the chlorides are removed.

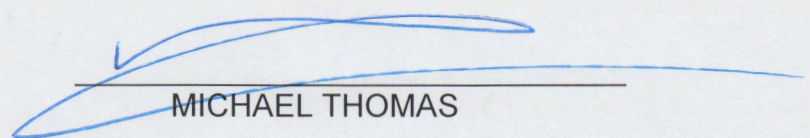
11. In contrast, steel-reinforced concrete that is continuously submerged in seawater (*e.g.*, pilings at the end of an oceanfront pier) will not deteriorate from chloride attack in that environment.

12. The chlorides cannot be removed from the benchwalls because they have infiltrated into them, including by entering the cracks, spalls, delaminations, splicing chamber, manholes and other portions of the benchwalls.

13. Because the chlorides cannot be removed, the benchwalls need to be replaced.

I declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct.

Executed on March 30, 2015  
Fredericton, NB, Canada



MICHAEL THOMAS